PRO Q

with generation 2 drive trays

Installation and User's Manual

Designed for Video Editing and Content Creation Professionals

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1. Introduction

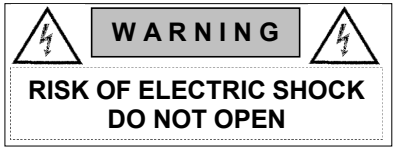
We appreciate your purchase of this product from Dulce Systems. You have everything you need to quickly and easily connect the storage unit to your editing computer. You are a short time way from your next blockbuster creation.

This Installation and User's Manual is intended to streamline the process of getting your RAID storage system up and running so you can get to work quickly.

For most typical video editing storage requirements, we have preconfigured the PRO Q for a much more streamlined installation. Refer to the Pre-configuration Sheet for the exact pre-configuration of your PRO Q, the default configured is for RAID 5 (efficient protection mode) and pre-formatted for Mac OS X. Just simply follow the installation steps outlined in this manual, and you will up and running in no time. For Windows operation, a short format process will be required.

1.1. Safety Considerations

1.1.1. SAFETY CONSIDERATIONS



WATER AND MOISTURE
To reduce the risk of fire or electrical shock, do not expose unit to rain or moisture. Do not operate unit near water – such as: bathtub, washbowl, kitchen sink or laundry tub, wet basement, or near a swimming pool.

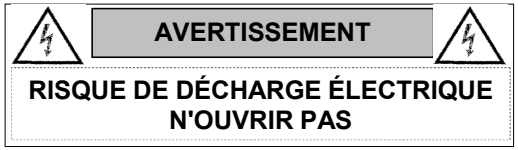
STABILITY
Do not place this unit on an unstable cart, stand, bracket, or table. Unit may fall, causing serious injury.

VENTILATION
Do not block front and rear ventilation. Proper airflow is required to ensure reliable operation and prevents unit from over heating. Do not place unit in an enclosed space where no or insufficient ventilation is available.

ELECTRICAL
Do not defeat the safety purpose of the grounding power plug. The power cord should be routed so that it is not likely to be walked on or pinched by items placed upon or against them.

SERVICING
Do not attempt to service this unit yourself. Opening or removing the top, side and rear covers will expose you to dangerous voltages or other hazards.

1.1.2. CONSIDÉRATIONS DE SÉCURITÉ



EAU ET HUMIDITÉ
Pour réduire le risque de feu ou de choc électrique, n'exposez pas d'unité pour pleuvoir ou l'humidité. Ne faites pas marcher d'unité près de l'eau – comme; la baignoire, la cuvette, l'évier ou la cuve de blanchisserie, la cave mouillée ou près d'une piscine.

STABILITÉ
Ne placez pas cette unité sur un chariot instable, un éventaire, une parenthèse ou une table. L'unité peut tomber, en provoquant la blessure sérieuse.

VENTILATION
Ne bloquez pas de devant et élevez la ventilation. L'écoulement d'air nécessaire est tenu de garantir l'opération sûre et prévient l'unité de sur le chauffage. L'unité ne peut pas placé dans un espace fermé où aucune ventilation ou dans suffisant n'est disponible.

ÉLECTRIQUE
Ne vainquez pas le but de sécurité de la prise de courant de pouvoir de bases. La corde de pouvoir devrait être mise en déroute pour qu'ils ne seront pas probablement marchés sur ou pincés par les articles placés sur ou contre eux.

ENTRETIEN
N'essayez pas d'assurer l'entretien de cette unité vous-même. En s'ouvrant ou le fait d'enlever le haut, le côté et les couvertures arrière vous exposeront aux voltages dangereux ou à d'autres hasards.

PRO Q Installation and User's Manual

1.1.3. SAFTY BERÜCKSICHTIGUNGEN

WASSER UND FEUCHTIGKEIT
Um eine Brand- oder Elektroschockgefahr weitgehend auszuschließen, Gerät nicht Regen oder Feuchtigkeit aussetzen. Gerät nicht in der Nähe von Bade- oder Waschwannen, Wasch- oder Spülbecken, feuchten Kellern oder Schwimmbecken betreiben.

STABILITÄT
Das Gerät nicht auf wacklige Karren, Ständer, Halterungen oder Tische stellen, da es herunterfallen und Verletzungen verursachen könnte.

BELÜFTUNG
Vordere und hintere Belüftungsöffnungen nicht versperren. Das Gerät muss ausreichend be- und entlüftet werden können, damit es sich nicht während des Betriebs überhitzt. Daher darf das Gerät nicht in geschlossenen Räumen aufgestellt werden, in denen keine ausreichende Be- und Entlüftung gewährleistet ist.

STROMVERSORGUNG
Nicht den Schukostecker modifizieren. Das Stromkabel sollte so verlegt werden, dass es nicht durch Auftreten oder durch spitze oder scharfe Gegenstände beschädigt werden kann.

WARTUNG
Das Gerät nicht eigenmächtig warten. Durch das Öffnen des Geräts (Abziehen der oberen, seitlichen und hinteren Abdeckung) setzen Sie sich lebensgefährlichen Spannungen aus.

1.1.4. CONSIDERACIONES DE SEGURIDAD

AGUA Y HUMEDAD
Para reducir el riesgo de fuego o electrochoque, no exponga la unidad para llover o humedad. No haga funcionar la unidad cerca del agua – como; bañera, lavatorio, fregadero o tina de lavandería, sótano mojado o cerca de una piscina.

ESTABILIDAD
No coloque esta unidad en un carro inestable, soporte, soporte o mesa. La unidad puede caerse, causando la herida seria.

VENTILACIÓN
No bloquee delantero y críe la ventilación. El corriente de aire apropiado es requerido asegurar la operación confiable y previene la unidad de sobre la calefacción. La unidad no puede colocado en un espacio incluido donde ninguna ventilación o en suficiente está disponible.

ELÉCTRICO
No derrote el objetivo de seguridad del enchufe de poder que da buenos conocimientos. La cuerda de poder debería ser derrotada de modo que ellos probablemente no sean andados en o pellizcados por artículos colocados sobre o contra ellos.

REVISIÓN
No intente atender esta unidad usted mismo. Abriéndose o quitar la cumbre, el lado y las tapas traseras le expondrán a voltajes peligrosos u otros riesgos.

1.2. System Requirements

Operating Systems:

- Windows XP / Vista 32/64-bit / Server.
- Mac OS X 10.4 or higher.

- Apple G5 with one available PCI-e x8 slot.
- Apple Mac Pro with one available PCI-e x8 slot.
- Windows compatible PC with one available PCI-e x8 slot.

- Internet connection (to download drivers and utilities).

1.3. Technical Support

Phone	818-435-6007
FAX	818-576-0324
E-mail	support@dulcesystems.com
Web	www.dulcesystems.com

If the product requires service, please contact Dulce Systems' Technical Support and obtain an RMA number. Ship the product properly packaged to:

Dulce Systems
Attn: RMA
9620 Topanga Canyon Place, Suite E Chatsworth, CA 91311

2. Getting Started

The PRO Q comes pre-assembled and ready for use, just install the drives and the supplied PCI-e (PCI-express) HBE (Host Bus Extender) for desktop or the ExpressCard Adapter if using a laptop, connect the cables, install the software driver and RAID Console. If you are using a Mac, you are good to go, by default the unit is pre-formatted for Mac OS X operation. For Windows, a small format procedure is needed.

2.1. Packaging

Please do not discard the boxes and packing materials in case you might need to reuse them later. Always ship the product in its original packaging. Improperly packaged products will be subjected to shipping damage, for which you will be liable for the repair.

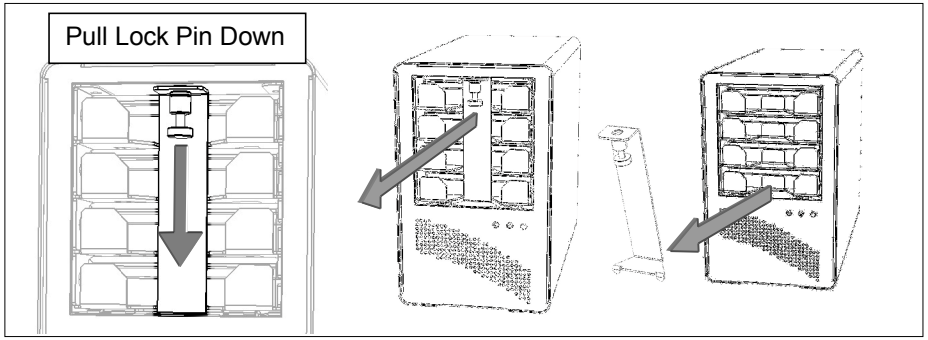
2.2. Check List

- Installation and User's Manual
- Power Cord (North America user only)
- A 4 Disk Modules generation 2 system enclosure
- 4 generation 2 Disk Modules
- A PCI-e x8 Host Bus Extender card or optional ExpressCard Adapter
- A 1-meter PCI-e x8 Extender Cable (3, 7 and 10-meters optional) or optional 1-meter PCI-e x1 Extender Cable

3. Overview

3.1. Removing the Disk Retainer

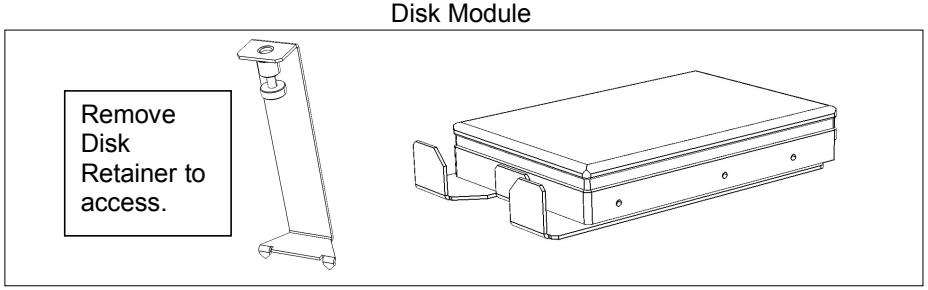
The Disk Retainer can be easily removed to access the Disk Modules. The retainer is secured by a lock pin, pull the lock pin down to unlock, title retainer forward and remove.



3.2. Disk Enclosure & Disk Module

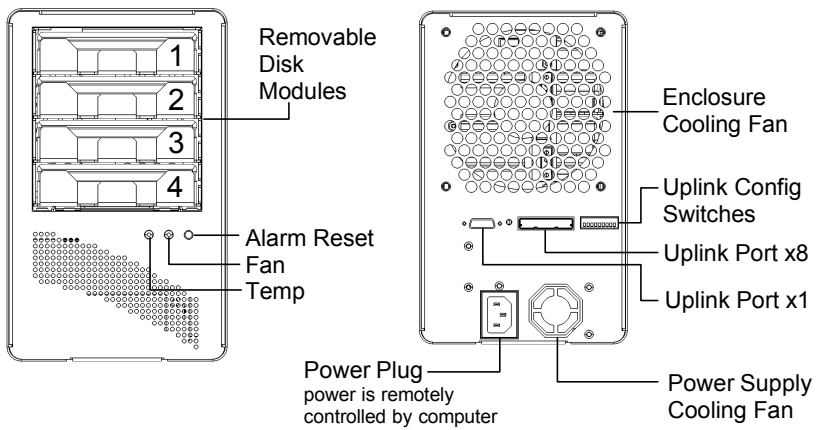
The disk enclosure has stand alone self-monitoring features. It monitors temperature and fan continuously. Should the temperature exceed a safe operating range or the fan spin below a preset minimum, the alarms will be triggered. A red indicator light will come on plus an audible alarm will sound.

Audible Alarm can be muted by pressing the Reset Alarm button. The red indicator remains on until the condition is corrected.

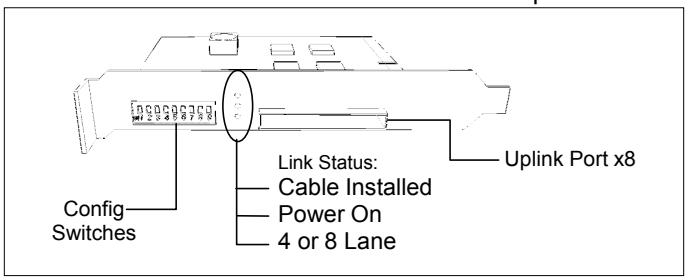


3.3. Front, back and adapters

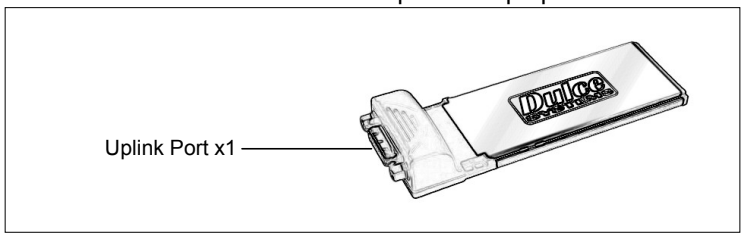
Front and Rear Views



Host Bus Extender Card for desktop



PressCard 34 Adapter for laptop



4. Installation

Please follow these few steps to install the PRO Q. This process typically takes about 20 minutes to complete.

Overview of installation:

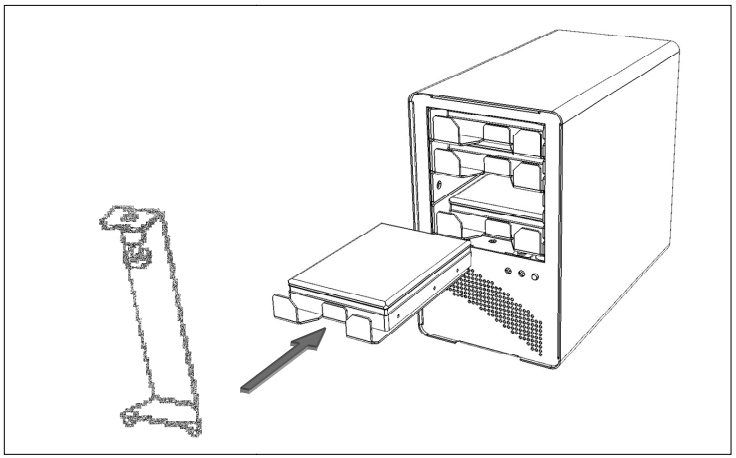
- Disk Module Installation
- Host Bus Extender or ExpressCard Adapter installation
- Connections of Uplink cable to the Drive Enclosure
- Driver Installation
- RAID Console Installation

The PRO Q is normally shipped pre-configured in RAID 5 mode and pre-formatted for Apple Mac OS X. After the driver installation step and a reboot, the PRO Q icon will appear on the desktop ready for use.

Windows operation will require a format/partition process. The PRO Q ship already pre-configured in RAID 5. After the driver installation, simply run the Windows Disk Management utility to prepare the RAID for Windows usage.

4.1. Disk Module Installation

Remove the Disk Retainer. Install each marked Disk Module into the slot indicated. Install the Disk Retainer.



4.2. Host Bus Extender Card (desktop)

The HBE is for installation in a desktop computer with an available PCI-e slot. Turn off the computer and unplug the power source before proceeding with the Host Bus Extender (HBE) Card installation.

PCI-express Host Bus Extender (HBE)

PCI-e (PCI express) and PCI-x are not compatible nor interchangeable with each other. A PCI-e card can only be installed in a PCI-e equipped computer and PCI-x card in a PCI-x equipped computer. Some computers support both PCI-e and PCI-x such as the HP xw series but not Apple Macs.

4.2.1. Switch Settings (HBE usage only)

Configuration switch settings are needed when using the HBE, if you are using the ExpressCard, this step can be skipped.

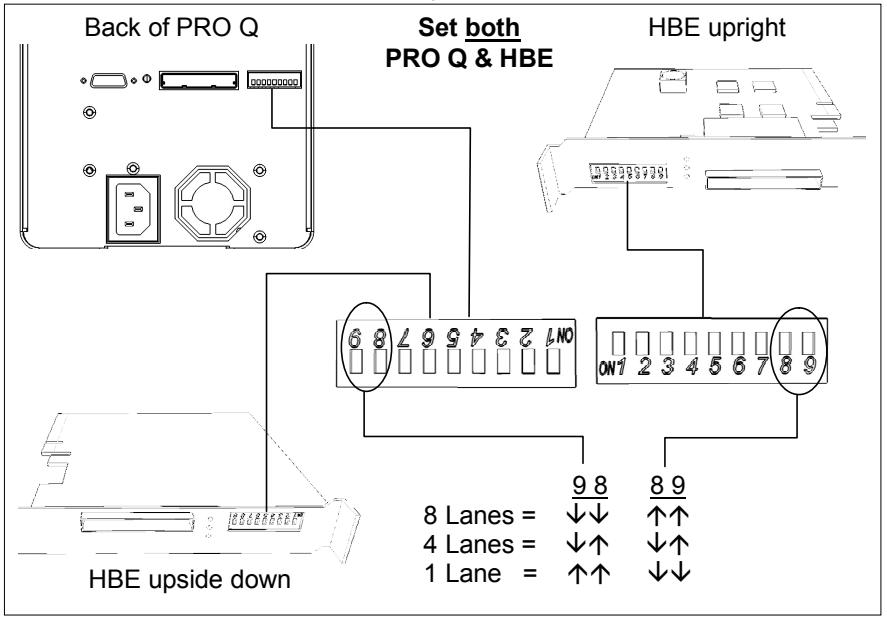
Determine the correct switch settings for PCI-e speed and cable length, set both the HBE and PRO Q to the same configuration.

The HBE Card and the PRO Q enclosure can operate at 1, 4 or 8 lane speed configurations. The maximum speed will be determined by the capability and selection of the computer's PCI-e slot. The HBE Card and the PRO Q must be configured to match the speed of the computer PCI-e slot.

PCI-e Lane Setting

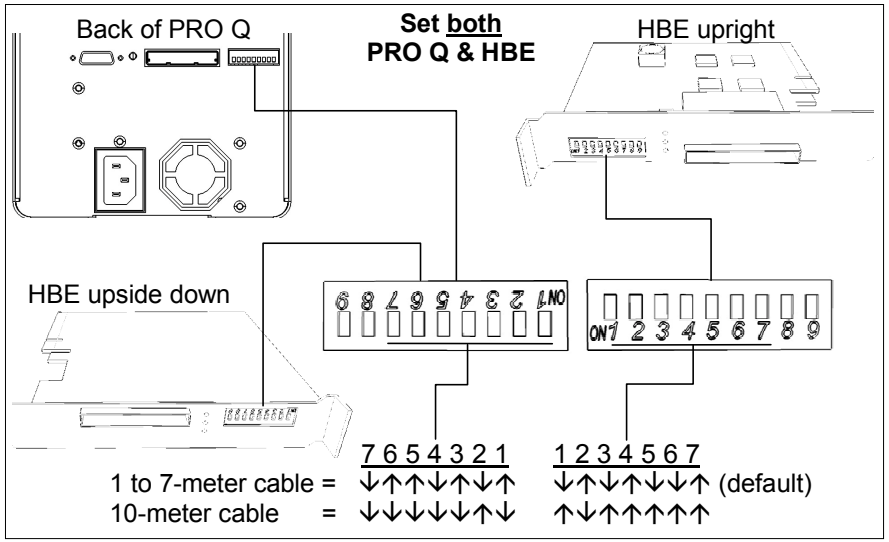
Switch 8 and 9 needs to be set to match the slot speed of the computer. If you are unsure, the 4 lane setting is a good place to start.

PCI-e lane speed selection



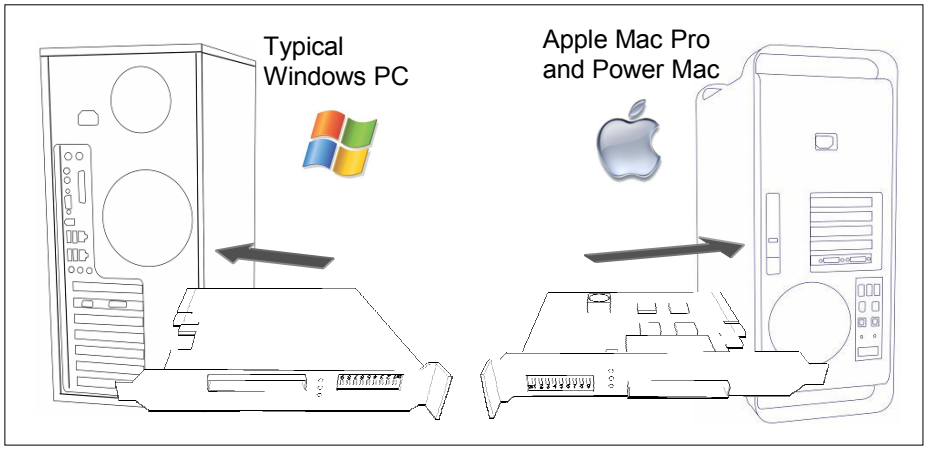
Cable length selection

The PRO Q is pre-configured for cable length of 1 to 7-meters, this step can be skipped if the cable is within this range. If a 10-meter cable is to be used, change the switch setting accordingly.


Back of PRO Q
Set both
PRO Q & HBE
HBE upright
HBE upside down
ON 1 2 3 4 5 6 7 8 9
ON 1 2 3 4 5 6 7 8 9
7 6 5 4 3 2 1
1 2 3 4 5 6 7
1 to 7-meter cable = ↓↑↑↓↑↓↑ ↓↑↓↑↓↓↑ (default)
10-meter cable = ↓↓↓↓↓↑↓ ↑↓↑↑↑↑↑

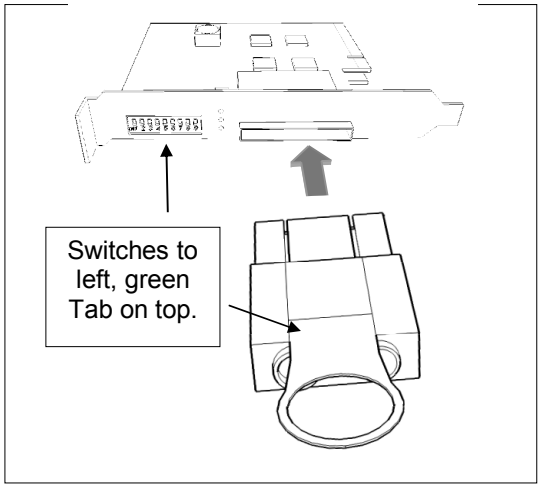
4.2.2. HBE Card Installation

The PCI-e HBE Card requires a x8 slot or larger. Computers with PCI-e slots less than x8 will not physically accommodate the HBE. PCI-e slots x8 or larger will work.

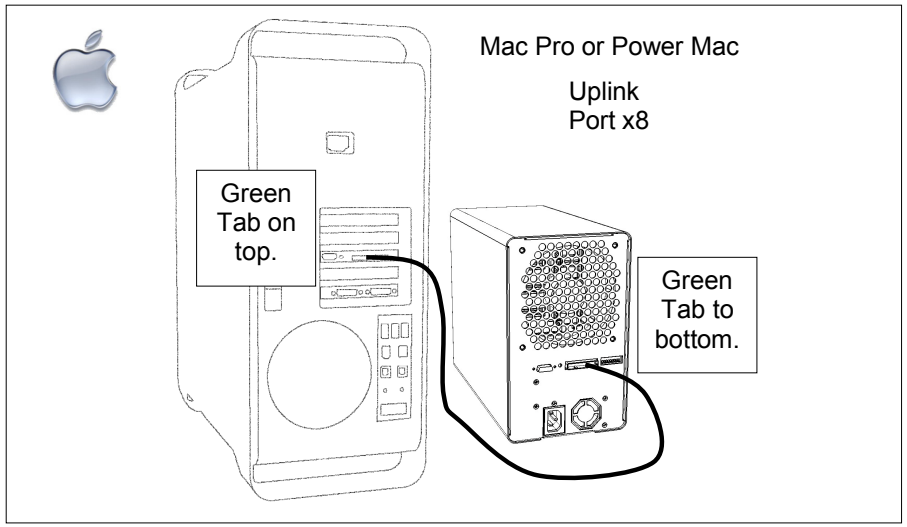


4.2.3. HBE Cable Connection

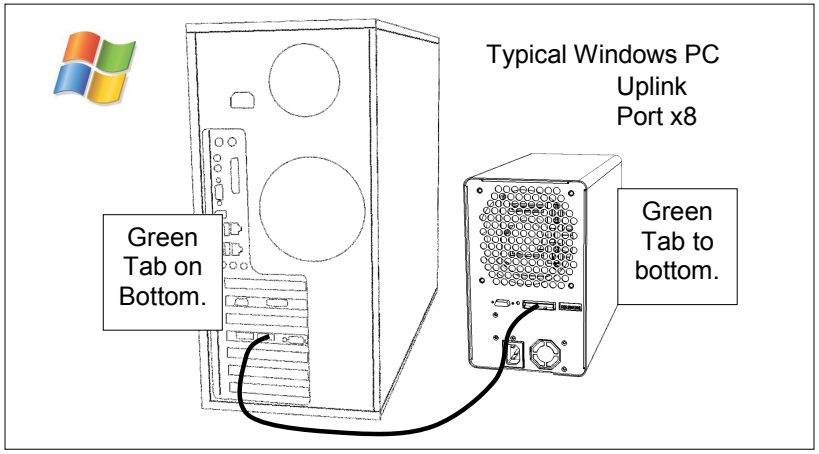
The HBE PCI-e x8 cable carries 8 lanes of the PCI-e interface. The green tab is up in this orientation. To remove, pull the tab to unlock the latches and then pull the metal body to remove the connector.



4.2.4. Mac Connection



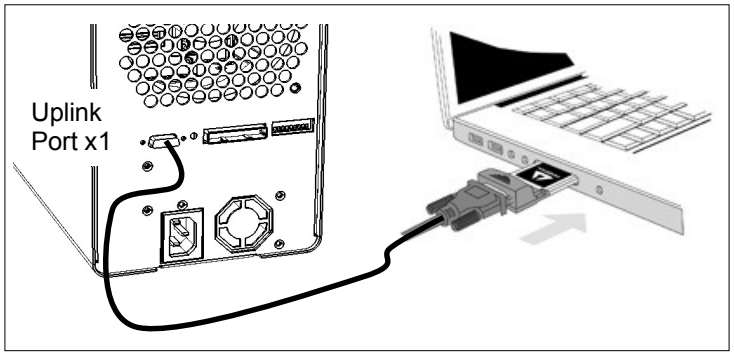
4.2.5. Windows PC Connection



4.3. ExpressCard Adapter (laptop)

The ExpressCard Adapter is for installation in a laptop equipped with an available ExpressCard 34 slot. ExpressCards are rated at PCI-e x1 speed (250MB/sec).

Turn off the laptop and PRO Q, insert the ExpressCard and connect the x1 cable. No switch setting adjustments are required when using the Uplink Port x1.



4.4. Driver Installation

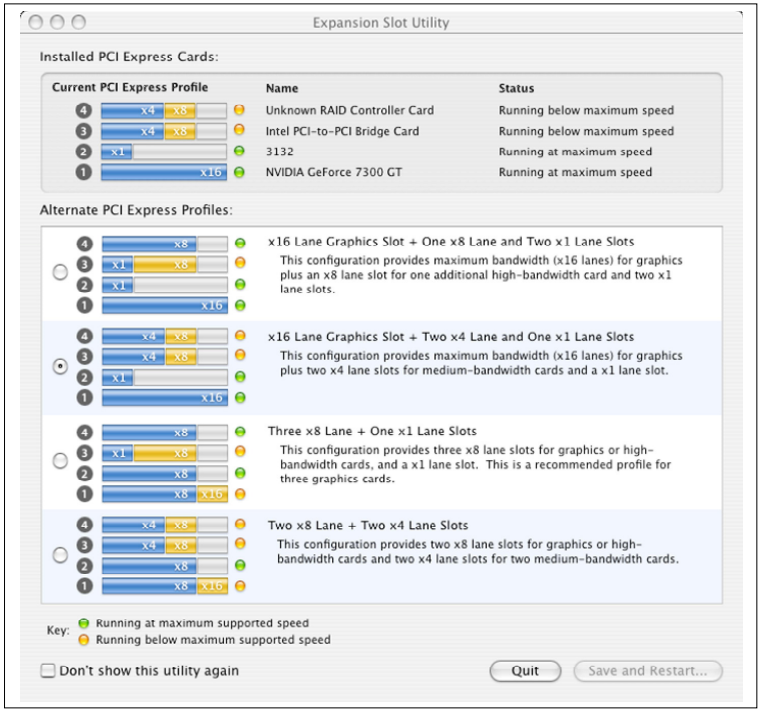
4.4.1. Mac Pro – Expansion Slot Utility settings

This section applies exclusively to the Apple Mac Pro produced in 2006 and 2007. Skip this section for Mac Pros from Early 2008 and later as well as all other computers.

The Mac Pro (Intel Xeon-based) will detect changes in the PCI-e slot configuration, it will automatically launch the Expansion Slot Utility where you can make performance adjustments for the various PCI-e slots. The utility can be manually started also, it can be found at: Under my Mac Pro: /System/Library/CoreServices.

Ensure there is at least a x4 speed assignment for the slot where the RAID Controller is installed (x8 is preferred), making sure also that your video capture/playback card and video display card also get a sufficient x value.

Example below is a good balance, it shows the RAID Controller in slot 4, a popular video capture card in slot 3, a eSATA adapter in slot 2, and the standard graphic card in slot 1.

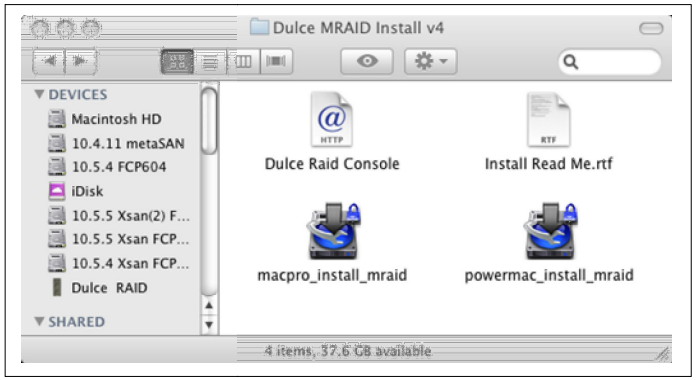

Expansion Slot Utility
Installed PCI Express Cards:
Current PCI Express Profile
Name
Status
Unknown RAID Controller Card
Running below maximum speed
Intel PCI-to-PCI Bridge Card
Running below maximum speed
3132
Running at maximum speed
NVIDIA GeForce 7300 GT
Running at maximum speed
Alternate PCI Express Profiles:
x16 Lane Graphics Slot + One x8 Lane and Two x1 Lane Slots
This configuration provides maximum bandwidth (x16 lanes) for graphics plus an x8 lane slot for one additional high-bandwidth card and two x1 lane slots.
x16 Lane Graphics Slot + Two x4 Lane and One x1 Lane Slots
This configuration provides maximum bandwidth (x16 lanes) for graphics plus two x4 lane slots for medium-bandwidth cards and a x1 lane slot.
Three x8 Lane + One x1 Lane Slots
This configuration provides three x8 lane slots for graphics or high-bandwidth cards, and a x1 lane slot. This is a recommended profile for three graphics cards.
Two x8 Lane + Two x4 Lane Slots
This configuration provides two x8 lane slots for graphics or high-bandwidth cards and two x4 lane slots for two medium-bandwidth cards.
Key:
Running at maximum supported speed
Running below maximum supported speed
Don't show this utility again
Quit
Save and Restart...

4.4.2. Mac Driver Installation

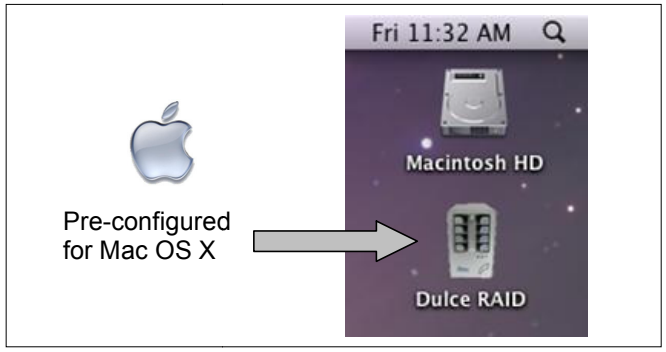
For the latest Mac drivers, please visit our web site and download the appropriate driver for your Mac.

Download From:	www.dulcesystems.com/download

After download, a folder named Dulce MRAID Install will be placed on your desktop. Open it and follow the simply steps outlined in the Install Read Me document.



After driver installation, reboot the computer and the PRO Q icon will appear on the desktop. Your new storage is now ready to go to work.



You may proceed to the RAID Console section if you wish to change the configuration or just to learn about the RAID Console.

4.4.3. Windows XP/2000 Driver Installation

After boot, Windows will detect the RAID Controller and launch the "Found New Hardware Wizard.", click Cancel to dismiss the wizard.

Download the latest driver and utility appropriate for your version of Windows.

Download From:	www.dulcesystems.com/download

Unzip the downloaded folders and place the content on the desktop.

Launch the Hardware Update Wizard (can be found at Start > Control Panel > System > Hardware < Device manager).

Expand Other Devices, right click RAID Controller, click Update Driver…., click Yes then Next.

Select "Install from a list….(Advanced)", click Next.

Browse to the unzip folder and follow the instructions on screen.

4.4.4. Windows Vista Driver Installation

For the latest Windows Vista driver, please visit our web site and download the most up-today driver.

Download From:	www.dulcesystems.com/download

Unzip the downloaded folder and place the content on the desktop.

Launch Device Manager (can be found at Start > Control Panel > Systems and Maintenance > System).

Expand Storage Controllers from the list, point to and right click on RAID Controller. Select Update Driver Software…

Browse to the unzipped download folder to install the driver. Successful installation will show (SCSIPORT) SATA RAID Host Adapter.

4.5. RAID Console Installation

4.5.1. Apple Mac RAID Console Installation

The RAID Console is automatically installed during the driver installation process. No additional steps are required to install the RAID Console. You may proceed directly to the RAID Console Operation section.

4.5.2. Windows PC RAID Console Installation

Download the latest RAID Console utility.

Download From:	www.dulcesystems.com/download

Unzip and run the setup.exe to install the RAID Console utility.

4.6. E-mail notification

Setting up an e-mail event notification is easy using the built-in SMTP mail configuration option.

For the latest up-to-day procedure, please check the Tech Notes section of the Dulce support web site:

www.dulcesystems.com > Support > Tech Notes

5. RAID Console Operations

5.1. Start RAID Console GUI

The RAID Console is where all of the management and maintenance of the storage unit is accomplished. After the installation process, the RAID Console is executed from your computer's Web Browser.

5.1.1. Start Apple Mac RAID Console GUI

For optimum results use FireFox web browser instead of Safari.

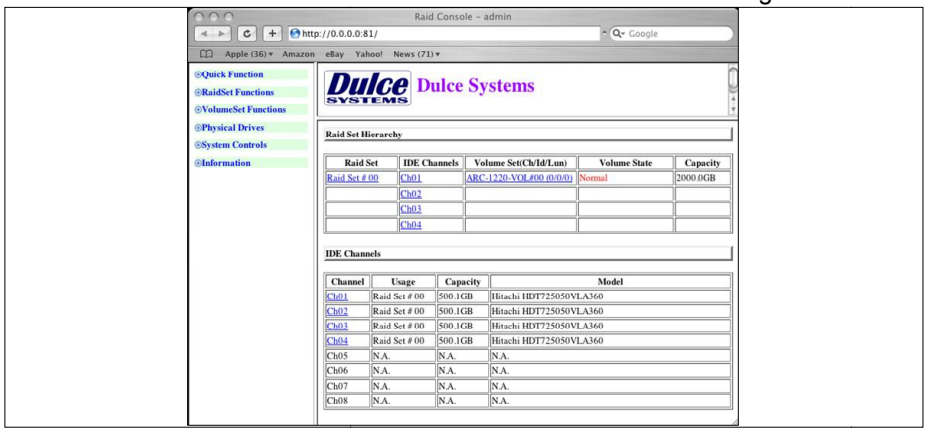
Double click on the Dulce RAID Console icon in the Dulce MRAID Install folder to launch the RAID Console. For quicker access, you may move the Dulce RAID Console icon to the dock.

Or manually enter **127.0.0.1:81** on the browser address line to start RAID Console.

To view this page, you need to log in to area "Raid Console" on 0.0.0.0:81.
Your password will be sent in the clear.
Name: admin
Password: ••••
Remember this password in my keychain
Cancel
Log In

- Default login name is: admin
- Default password is: 0000 (four zeros)

Welcome screen of RAID Console after successful login:



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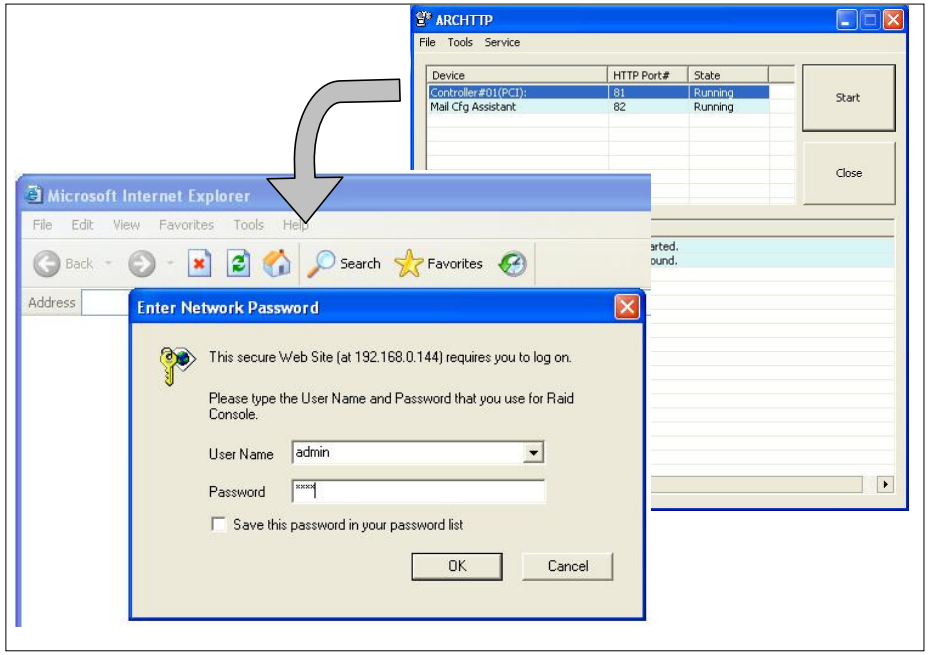
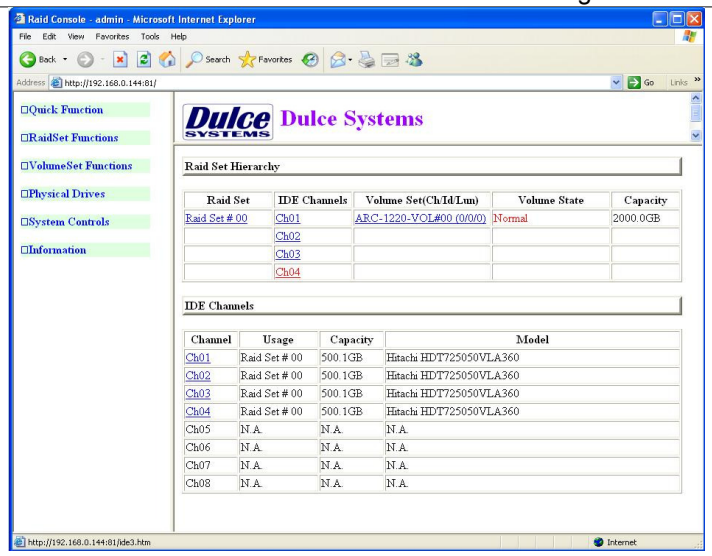
5.1.2. Start Windows PC RAID Console GUI

Start the RAID Console from Start > All Programs > Areca Technology > ArcHttpSrvGUI > Areca HTTP Proxy Server GUI.

- The ARCHTTP service will start
- Double click on the Controller #01 to start the RAID Console
- Default login name is: admin
- Default password is: 0000 (four zeros)



- Welcome screen of RAID Console after successful login:



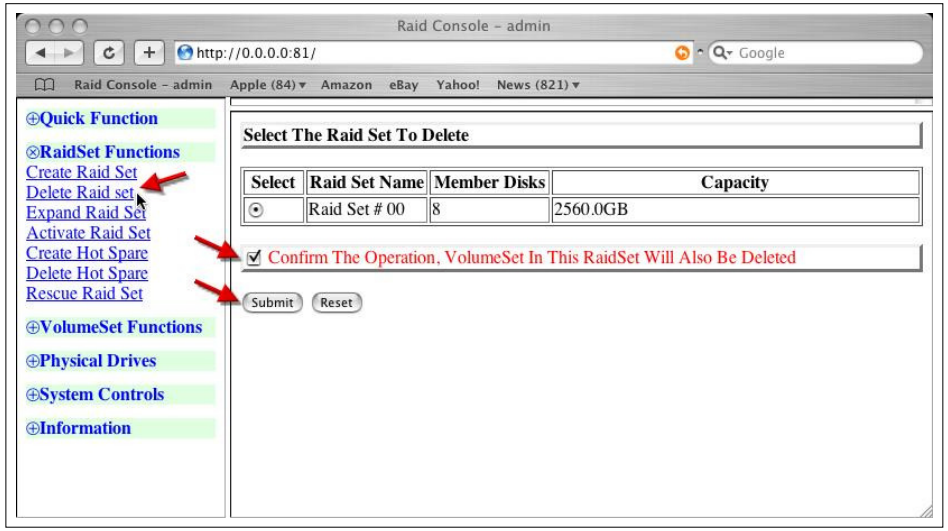
5.2. Change RAID Mode – Deleting / Creating

This procedure will erase all data on the PRO Q.
Changing the RAID mode requires the current RAID Set to be deleted first, then create a new RAID Set with the new RAID mode.

5.2.1. Delete the RAID Set

From the RAID Console GUI. On the left side menu bar click on

- RaidSet Functions > Delete Raid Set
- Select the Raid Set and check the Confirm box
- Click Submit to delete the RAID Set



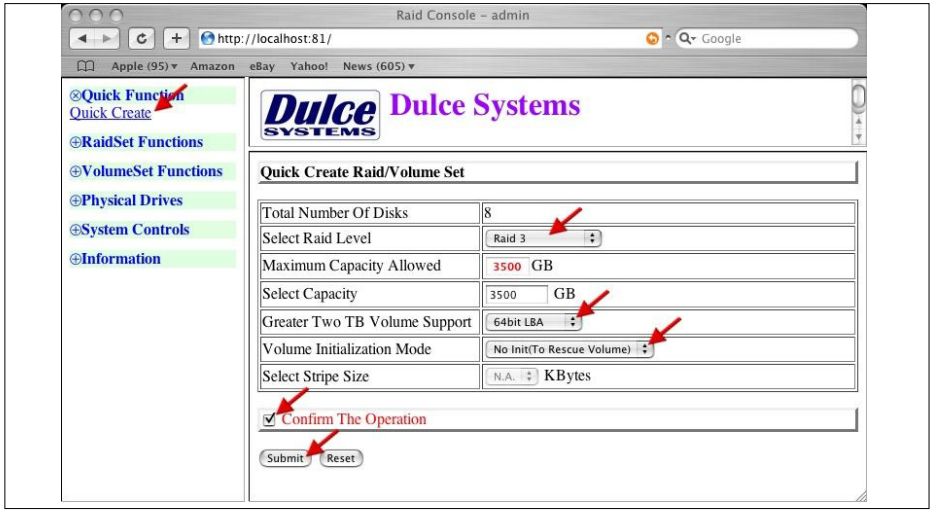
5.2.2. Create a RAID Set

No need to wait for hours of format, simply select the **No Init** option in the **Volume Initialization Mode** field.

For Windows XP (32 bit) with larger than 2TB RAID, read next section.

From the RAID Console GUI. On the left side menu bar click on

- Click on **Quick Function** > **Quick Create**
- Change the Select Raid Level as desire
- Change Greater Two TB Volume Support: Set to **64bit LBA**
  Windows XP (32 bit): Set to **No**.
- Volume Initialization Mode: Change to **No Init**.
- Check Confirm the Operation
- Click **Submit**



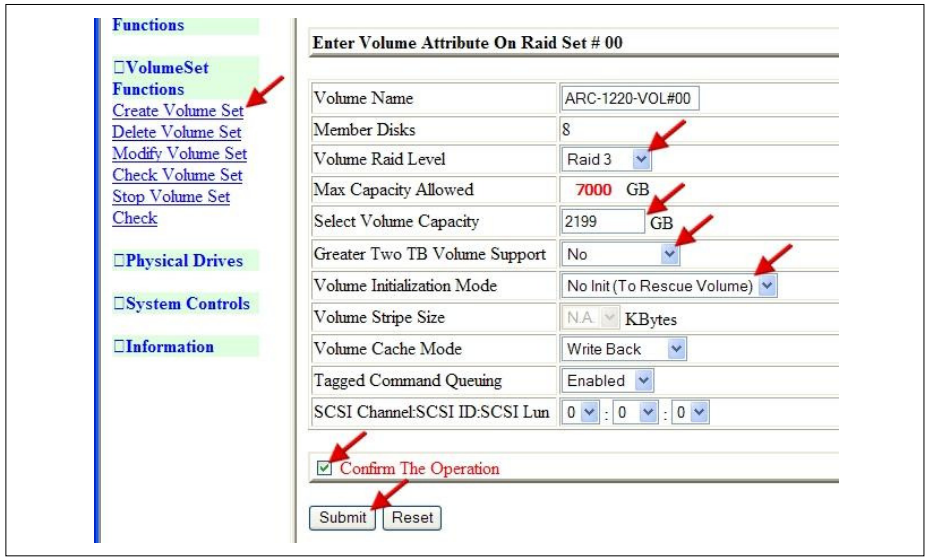
No Init allows for immediate RAID Set availability. The RAID is ready for the OS format and partition.

5.2.3. Create >2TB RAID Set for Windows XP (32bit):

If RAID is larger than 2TB, configure using multiple 2TB Volumes and then use Windows to Span them together. This will end up with one drive letter of the full capacity of the RAID.

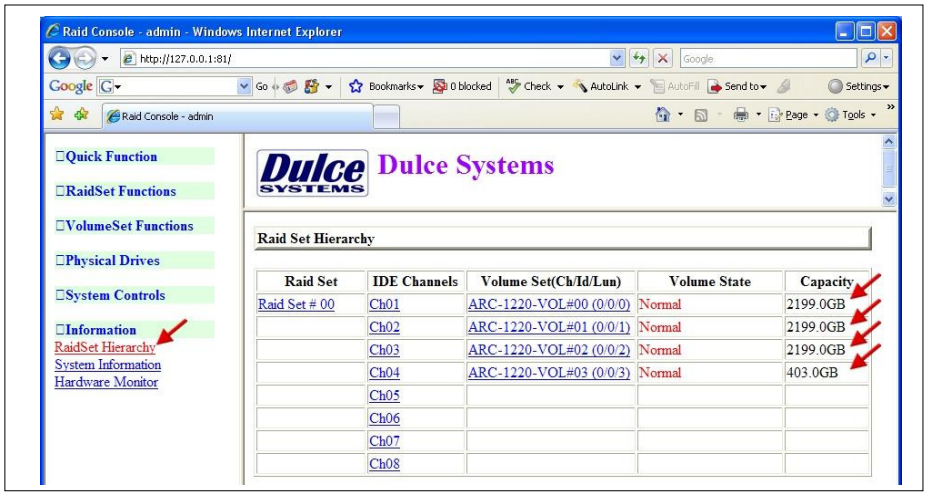
1)
Create the RAID Set under RaidSet Functions by selecting all of the drives.

Create multiple Volume Sets under the VolumeSet Functions
Select the desired Volume Raid Level
Set the Select Volume Capacity to 2199GB
Set Greater Two TB Volume Support to No
Set Volume Initialization Mode to No Init (if applicable)*
Check the Confirm the Operation box
Click Submit
Repeat this step until all of the space are assigned.

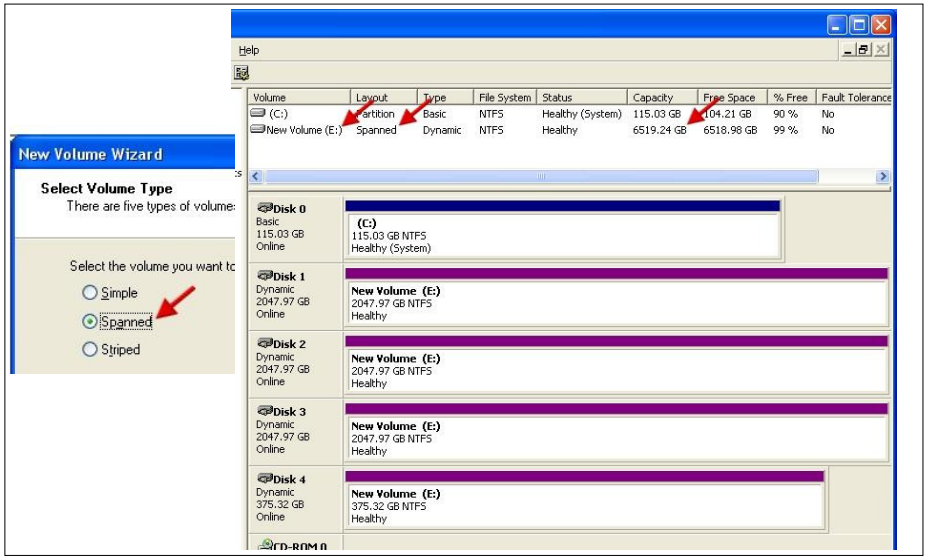


* By setting the Volume Initialization Mode to No Init will result in immediate availability of the RAID set, no need to wait for long initialization time.

To view and confirm the Volume settings, select Information > RaidSet Hierarchy.

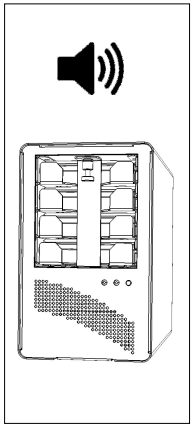


2)
In Windows Disk Management, make these volumes as Dynamic Disks and span them together to make one large disk. Spanning is recommend as oppose to striping. Striping in this configuration requires more system overhead and will actually reduce performance. Use Spanning.



6. Alarm Conditions / Degraded RAID Set

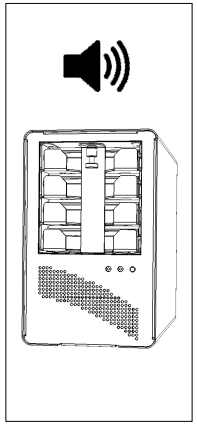
There are two possible sources for alarms: one from the front of the drive enclosure, the other from the RAID Controller installed inside the PRO Q.



Enclosure Alarms (front right)
(Audible and red indicators):

- Temperature (enclosure detected over heating condition)
- Fan (enclosure cooling fan not operational, could lead to over heating)

Mute Alarm: Enclosure audible alarm can be muted by pressing the Reset button next to the indicators, the red indicator remains on until the condition is corrected.

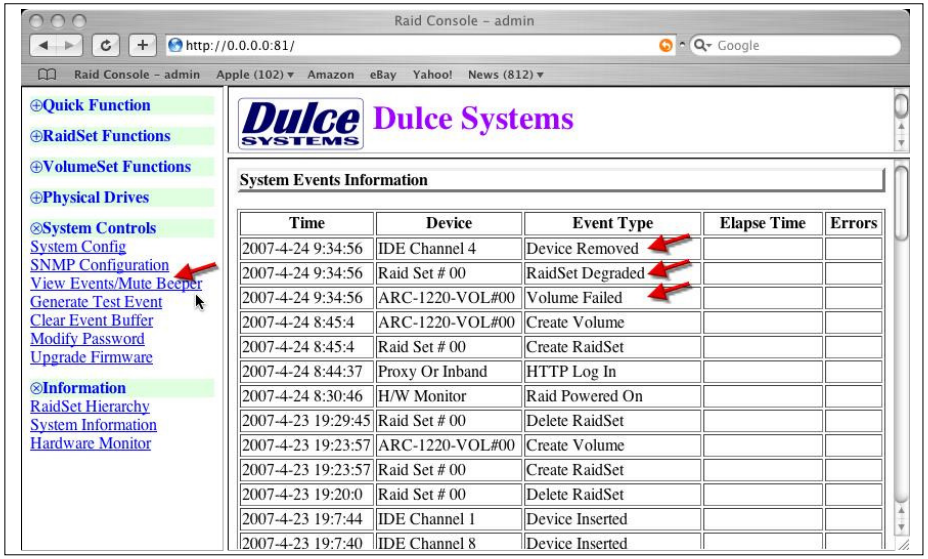


RAID Controller Alarm
(Audible and RAID Console GUI indicator):

- Degraded RAID Set (one or more drives not detected or down)
- Temperature (RAID Controller detected over heating)

Mute Alarm: RAID Controller Alarm can be muted by the RAID Console. Start the RAID Console GUI, go to System Controls > View Event / Mute Beeper.

The Systems Event Information screen provides a log of events which triggered the alarm. The example below shows the RAID Set is degraded because IDE Channel 4 (drive 4) was removed.



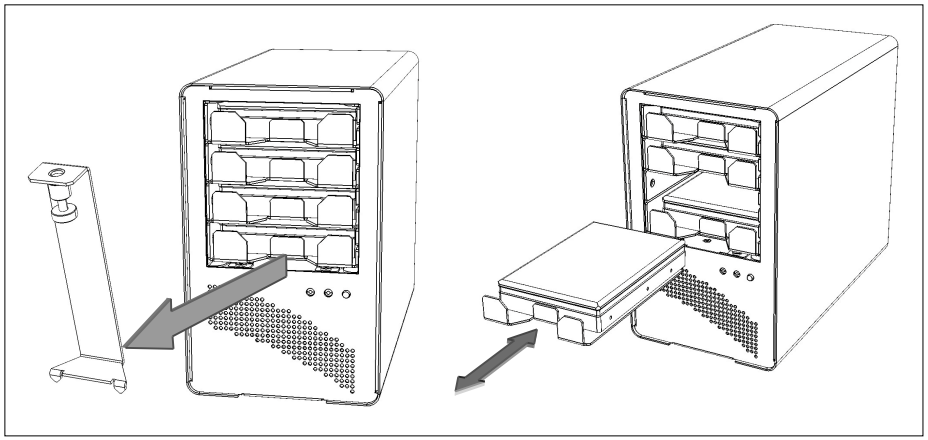
Time	Device	Event Type	Elapse Time	Errors
2007-4-24 9:34:56	IDE Channel 4	Device Removed		
2007-4-24 9:34:56	Raid Set # 00	RaidSet Degraded		
2007-4-24 9:34:56	ARC-1220-VOL#00	Volume Failed		
2007-4-24 8:45:4	ARC-1220-VOL#00	Create Volume		
2007-4-24 8:45:4	Raid Set # 00	Create RaidSet		
2007-4-24 8:44:37	Proxy Or Inband	HTTP Log In		
2007-4-24 8:30:46	H/W Monitor	Raid Powered On		
2007-4-23 19:29:45	Raid Set # 00	Delete RaidSet		
2007-4-23 19:23:57	ARC-1220-VOL#00	Create Volume		
2007-4-23 19:23:57	Raid Set # 00	Create RaidSet		
2007-4-23 19:20:0	Raid Set # 00	Delete RaidSet		
2007-4-23 19:7:44	IDE Channel 1	Device Inserted		
2007-4-23 19:7:40	IDE Channel 8	Device Inserted		

6.1. Replacing a Disk Module

A defective Disk Module can be easily replaced. Hot swapping is allowed without interruption to your workflow if the RAID is operating in one of the drive redundant RAID mode (1,3,5,6).

In a redundant RAID mode, rebuild will start automatically after replacement of a defective module.

- Remove the Disk Retainer
- Remove the defective disk and insert the replacement.



7. Formatting and Partitioning

7.1. Apple OS X Formatting

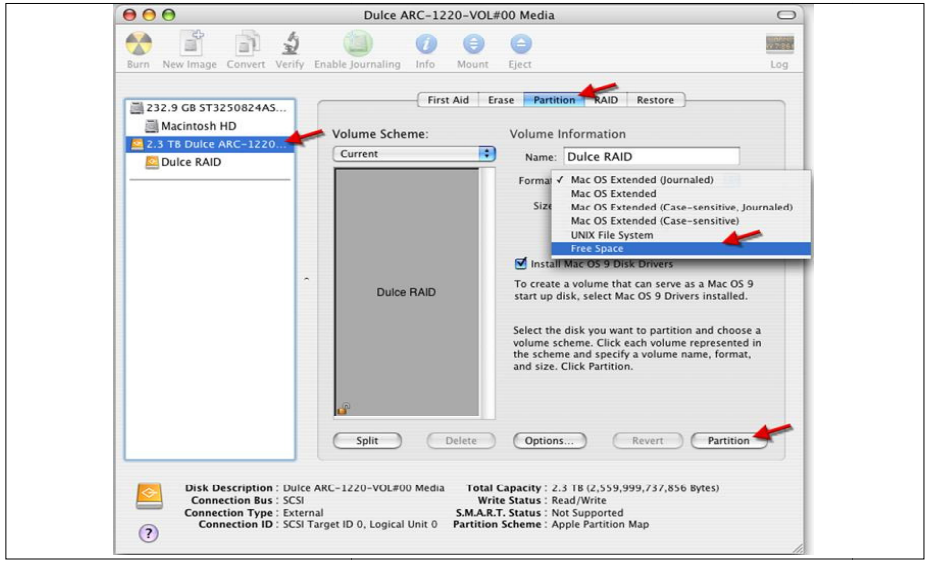
The PRO Q are shipped pre-configured for Mac OS X, the RAID will appear on the desktop after driver installation and reboot.

Should it be necessary to re-format and partition the RAID, use the Apple Disk Utility.

To start Disk Utility, move pointer to upper left corner of screen, click on Go then click on Utilities. Locate and launch Disk Utility.

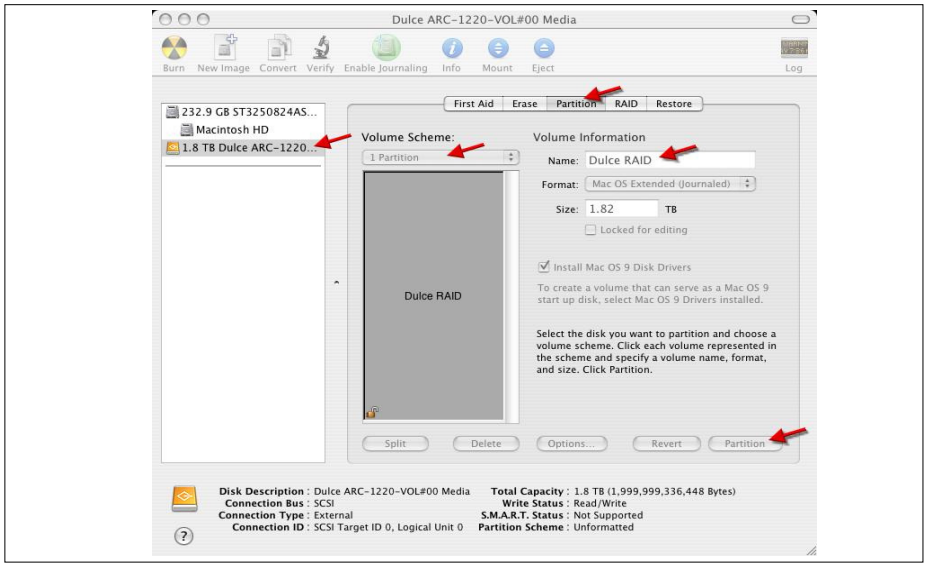
7.1.1. Erase an existing partition

Select the RAID on left, click on Partition tab, select Free Space. Click on Partition on lower right.



7.1.2. Create a new partition

Select Dulce on the left side drive list, click on Partition tab, change Volume Scheme to 1 Partition, change Name as desired, click on Partition on lower right.



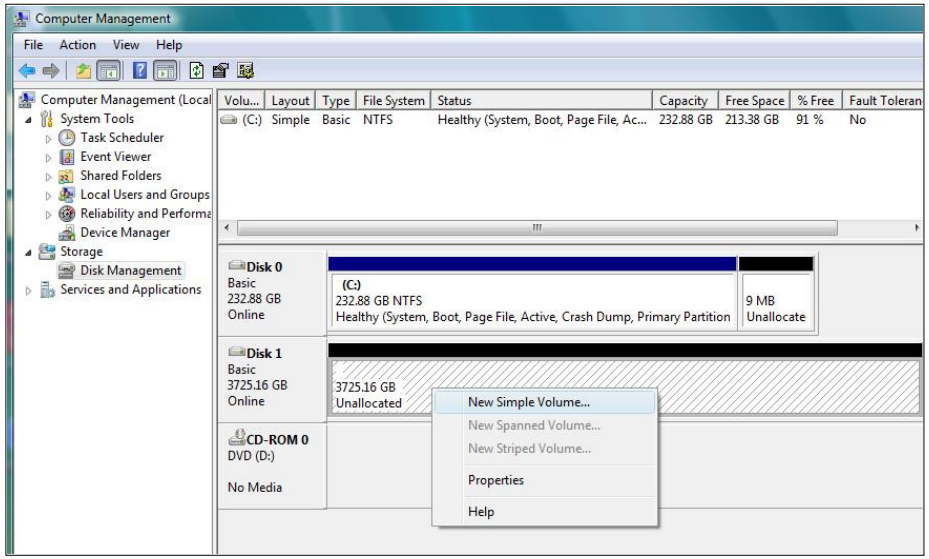
The drive will appear on the desktop after successful completion of the Partition.

7.2. *Windows XP / Vista Formatting*

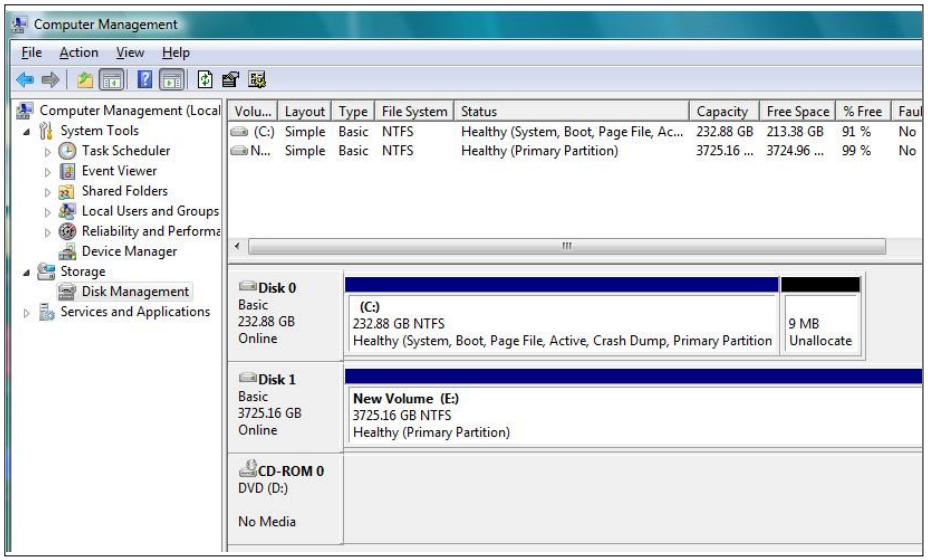
Start Disk Management (can be found at Control Panel > System and Maintenance > Administrative Tools > Computer Management. Under Storage.)

If the RAID shows up as Unknown / Not Initialized, right click on the disk and Initialize it.

If the drive is larger than 2TB, if using Vista, right click over the disk and Convert to GPT Disk. Windows XP 32 bit does not support larger than 2TB capacity. Configure with multiple capacities of 2TB or less.



Right click the Unallocated segment and select New Simple Volume. Enter the desired Volume Size, assign the desired Drive Letter or Path, check Perform a Quick Format at the Format Partition screen.



8. RAID Level Descriptions

Although the RAID Controller supports a large variety of RAID Levels, RAID 0 or RAID 3 are most commonly used for video and content creation purpose.

RAID Level	Description	Advantage	Disadvantage	Ideal for
0	Striping.	Highest performance.	No disk redundancy, one drive failure will lose all data.	Highest resolution HD, 2K, and maximum multiple streams.
1	Mirroring.	Highest redundancy.	Less cost efficient for redundancy, loses ½ disk capacity.	Data protection is paramount, maximum disk failure protection.
3	Striping with a dedicated parity drive.	Efficient drive redundancy, 1 drive used for parity.	Loses 1 disk drive capacity.	Well balanced for video requiring performance and redundancy.
5	Striping the parity across all drives.	Efficient drive redundancy, parity distributed to all drives.	Loses 1 disk drive capacity.	Well balanced for file server requiring performance and redundancy.
6	Striping with two dedicated parity drives.	Double drive redundancy, 2 drives used for parity.	Loses 2 disk drive capacity.	Mission critical.
JBOD	Just a Bunch of disks.	Each drive can be accessed individually from operating system.	No redundancy.	Audio applications.
RAID + Spare	A drive is set aside as an online hot spare.	Automatic rebuild of a failed drive.	Loses another drive capacity. (In addition to the drive(s) needed for the RAID level selected.)	Minimizes degraded RAID level exposure time.

9. Limited Warranty

WHAT THE WARRANTY COVERS

Dulce Systems warrants your product against any defect in material and workmanship and conforms to Dulce published specifications under normal use.

WHAT THE WARRANTY DOES NOT COVER

The warranty does not cover equipment which has been damaged due to accident, misuse, abuse, fire, flood, "Acts of God," or other contingencies beyond our control; use of incorrect line voltages; improper or insufficient ventilation; failure to follow operating instructions; or improper or unauthorized repair; improperly packaged for shipping; packaged in non-approved shipping container; shipping damage.

The warranty is voided by removal or alteration of the product or parts identification labels.

Dulce has no liability for general, consequential, incidental or special damages. These include loss of recorded data, the cost of recovery of lost data, lost profits and the cost of the installation or removal of any Products, the installation of replacement Products, and any inspection, testing, or redesign caused by any defect or by the repair or replacement of Products arising from a defect in any Product.

WHAT THE WARRANTY PERIOD IS

Dulce Systems warrants your PRO Q product for 36 months. The warranty period begins at the date of shipment to the original end user, company or organization.

Our warranty applies to repaired or replaced Products for the balance of the applicable period of the original warranty or ninety days from the date of shipment of a repaired or replaced Product, whichever is longer.

WHAT WE WILL DO TO CORRECT THE PROBLEM

We may elect which remedy or combination of remedies to provide at our sole discretion. We shall have a reasonable time after determining that a defective Product exists to repair or replace a defective Product. Our replacement Product under its limited warranty will be manufactured from new or reconditioned parts.

Your exclusive remedy for any defective Product is limited to the repair or replacement of the defective Product.

We will return the repaired or replacement Product to you prepaid using the same method of shipping (ex: overnight, ground, 2nd day, …) as was shipped to us. If a more expedited return shipping method is required, extra charges might apply at our discretion.

HOW YOU CAN GET SERVICE

Contact our Technical Support to obtain a RMA (Return Materials Authorization) number. The model number, serial number, and description of the problem will be required. A valid proof of purchase might be required to further validate the Products warranty eligibility, the valid proof of purchase document must show the product model, serial number, purchase date, and supplier name. If the valid proof of purchase is not available, the original manufacturing date of the product will be used to determine the warranty period.

No returns will be accepted without a RMA number. We reserve the right to refuse the delivery of the return.

You shall bear all shipping, packing and insurance costs and all other costs, excluding parts and labor, necessary to effectuate repair or replacement under this warranty.

All products returned to us must be shipped in the original packaging or Dulce approved packaging. If you do not have the original packaging, call us to request packaging. A nominal fee will be charged for the requested packaging and for shipment. Ship the RMA to us pre-paid.

Products that are improperly packaged for shipping; packaged in a non-approved shipping container; or incur shipping damages are not covered under warranty.

HOW STATE LAW RELATES TO WARRANTY

In the United States, some states do not allow exclusion or limitation of incidental or consequential damages, so the limitations above may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

10. Product Registration

R E G I S T E R N O W

It will take only one minute to register.

Please visit our web site and register online.

www.dulcesystems.com/register

A valid proof of purchase might be required to further validate the Products warranty eligibility, the valid proof of purchase document must show the product model, serial number, purchase date, and supplier name. If the valid proof of purchase is not available, the original manufacturing date of the product will be used to determine the warranty period.

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PRO Q Installation and User's Manual

www.dulcesystems.com